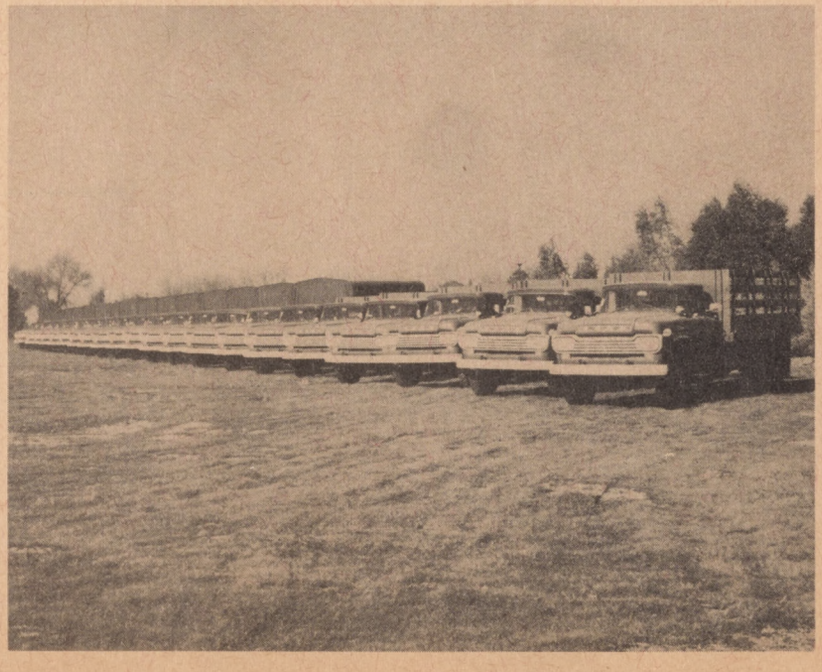


STATE
OF
CALIFORNIA

FOREST FIRE REPORT
1958
DIVISION OF FORESTRY

DEPARTMENT
OF
NATURAL RESOURCES





State of California

Department of Natural Resources

DIVISION OF FORESTRY

ADMINISTRATIVE —DISTRICTS—

I NORTH COAST
II NORTHERN DISTRICT
III SACRAMENTO
IV SAN JOAQUIN
V CENTRAL COAST
VI SOUTHERN DISTRICT

—LEGEND—

DISTRICT HDQS.

DISTRICT BOUNDARY

CALIFORNIA DIVISION OF FORESTRY

1958 FOREST FIRE SEASON

1. CHARACTER AND EXTENT OF THE FIRE SEASON

Although California's Fire Season opened quite normally on May 1 in Southern California and May 16 in the Northern and Central sections, the balance of the season was one of contrasts and extremes in fire occurrence, lightning activity, and weather.

During 1958 there were 3,088 forest fires on those lands directly protected by the State Division of Forestry in Zones I and II. This is the highest number on record, and in comparison to the 1948-57 average, a staggering increase of 47 percent. For comparative purposes, the three previous high occurrence years during the last decade were; 2608 fires in 1949, 2643 in 1946, and 2512 in 1945. The three low occurrence years during this same period were 1758 fires in 1956, 1941 in 1955, and 1973 in 1948.

In spite of the record breaking number of fires, the 146,121 acres of timber, watershed, and range lands that were destroyed, fits into the average acreage burned figure without disturbing it.

There were 99 of the major type (300 acres or larger) fires this year, as compared to 70 last year. Again this year, as in the past, this small percentage of fires (3.2% of the total) burned the lion's share of the acreage, 107,079 acres or 73.3% of the total acreage burned.

Lightning caused fires created a big work-load this year. There were 474 such fires, which is also the highest on record, and of course, one of the factors contributing to the record breaking total fire occurrence. For comparative purposes, the three previous highs during the past decade were; 301 in 1951, 223 in 1949, and 205 in 1952. The three years of lowest occurrence during this same period were; 62 in 1954, 91 in 1957 and 140 in 1955. The 1948-57 average is 145 per year. While the thunderstorm activity was not limited to the months of June, July and August, the storms during

these three months were the extremely violent type. During June the Northern part of the State actually experienced twenty-two days of thunderstorm weather. Fortunately, precipitation accompanied most of the June storms, and the lightning caused fires that did start were insignificant. July was the month during which the heaviest concentration of lightning caused fires occurred. During the latter one-half of the month, the Division experienced approximately 200 lightning caused fires that destroyed nearly 10,000 acres. Except for one extremely violent storm that raged across the central part of the state during the middle of August, the majority of the thunderstorm activity occurred in the northern and southern sections of California.

What appeared to be sufficient precipitation to close the declared fire season on the normal closing date of November 15 was soon altered by drought conditions. This unusual drought condition existed throughout California for the remainder of November, all of December, and through the first week of January. Southern California not only experienced drought, but also suffered prolonged periods of very severe "Santana Winds". Burning conditions were from above normal to extreme; it was like a fire season "Out of Season". According to the U. S. Weather Bureau, the unseasonably warm and dry weather was caused by a high barometric ridge that "blocked off" the rain producing storm fronts that normally enter California during the months of November and December. The State Forester terminated the fire season on January 7, 1959 after a general rain spread throughout the State.

Due to this unusual November and December drouth, an emergency proclamation was issued by DeWitt Nelson, Director of Natural Resources. This proclamation declared that a written permit from F. H. Raymond, State Forester, was required when burning inflammable material or using explosives on forest, brush, or grass covered lands after December 1, 1958. A written permit is not usually required during the December 1 - April 15 period.

The following tables compare percentagewise, the occurrence and acreage burned during 1958 with the 1948-57 average, for each of the six administrative districts:

State Direct Protection Area
Zones I and II

District	Occurrence 1958	1948-57 Average	% of Increase or Decrease	Acreage Burned 1958	1948-57 Average	% of Increase or Decrease
North Coast	783	554	+ 41	23,526	45,438	- 48
Northern	673	396	+ 70	19,914	20,391	- 2
Sacramento	625	505	+ 24	14,387	17,453	- 18
San Joaquin	227	138	+ 64	14,447	11,400	+ 27
Central Coast	260	192	+ 35	14,844	24,265	- 39
Southern	520	321	+ 62	59,003	26,438	+ 123
Statewide	3088	2106	+ 47	146,121	145,385	+ 1

The following tables summarizes the fire record for the State Direct protection areas and for all Clarke-McNary lands within the State:

Annual Forest Fire Statistics

Year	State Direct Protection - Zones I & II Total No. Fires	Man-Caused Fires	Total Acreage Burned	Class E Fires (300 Acres or Larger)	Statewide All Clarke-McNary Areas Total No. Fires	Man-Caused Fires	Total Acreage Burned
1948	1,973	1,898	133,223	51	2,134	2,023	124,206
1949	2,608	2,385	132,253	80	2,726	2,313	117,020
1950	2,264	2,118	303,393	105	2,556	2,078	270,150
1951	2,159	1,858	148,360	79	2,439	1,880	137,851
1952	2,263	2,058	120,974	87	2,422	1,936	83,967
1953	2,080	1,932	125,150	58	2,214	1,850	152,670
1954	2,017	1,955	140,072	73	1,993	1,866	104,488
1955	1,941	1,801	161,510	61	2,070	1,701	209,141
1956	1,758	1,566	64,617	39	2,127	1,607	87,868
1957	1,986	1,895	124,316	70	2,038	1,895	110,182
1958	3,088	2,614	146,121	99	3,109	2,359	142,915

On all Clarke-McNary throughout the State there were 82 fires in the 300 acres or larger class. These fires burned acreage as follows:

Forested Land	6,340 acres
Non-Forest	136,575 acres
Total	142,915 acres

2. PROGRESS MADE IN EXTENDING PROTECTION TO NEW AREAS AND ESTABLISHMENT OF BETTER PROTECTION IN OLD AREAS

A. New Areas:

In 1958, an area of 6,479 acres was added to the Tehama Ranger Unit, and 34,896 acres were added to the Butte Ranger Unit. These two units are collectively known as the Butte Meadows Acquisition. There are 6,306 acres of National Forest land and 62,159 acres of state and private land, for a total acreage of 68,465. The Butte Meadows Forest Fire station, a #3 crew, was added to the suppression organization.

B. Old Areas:

(1) Three lookouts were taken over from the U.S. Forest Service:

Inskip Hill	Tehama Ranger Unit
Banner Mountain	Nevada-Yuba Ranger Unit
Eshom Point	Tulare Ranger Unit

(2) The 1958-59 fire suppression organization is as follows:

230 Crews* — 54 - #1; 38 - #2; 111 - #3; 19 - #4; 8 - #5

35 Patrolmen

82 Lookouts (Three are manned by Lookout-Patrols)

49 Bulldozer-Transport Units
(29 Large, D-7 o/e)
(21 Medium, D-4 o/e)

*With the adoption of the 1956 Fire Plan, the designation of crews changed from 4, 9 and 13 man crews to #1, #2, #3, #4, or #5 crew. The #3, #4, and #5 crews have 2 fire trucks.

(a) #1 Crew: 1.5 foremen; 1 driver; 3 firefighters

(b) #2 Crew: 1.5 foremen; 1 driver; 6 firefighters; 1 cook

(c) #3 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal); 6 firefighters; 1 cook

(d) #4 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal); 8 firefighters; 1 cook

(e) #5 Crew: 1.5 foremen; 2 drivers (1 yearlong; 1 seasonal); 10 firefighters; 1 cook

C. Initial Attack Air Program:

The increased use of air tankers on 1957 campaign fires prompted the Division to undertake an extensive experimental initial attack air program during the 1958 fire season. To provide sufficient data from which to evaluate aircraft in initial attack, five operating areas were chosen representing a diversified range of topography, vegetative cover types, and burning conditions. Aircraft types varied insofar as possible within the limits of availability, from which information could be obtained to determine their relative effectiveness.

Three of the projects operated through the major portion of the season, while the other two were limited in the duration and scope.

The North Coast operation was divided, one being centered at Hoberg's airport in Lake County, the other at Ukiah, Mendocino County. A Stearman having a capacity of 120 gallons of borate fire retardant, and a N3N with a capacity of 180 gallons were operated out of the Hoberg airport, while two N3N's were based at Ukiah. Since the bases were only 35 miles apart it added to the flexibility and range of the operation with little or no loss of initial strength. During the operational period of July 15 to October 4 initial attack action was taken on 72 fires with a total of 670 drops being made.

The Central Sierra operation based at the Columbia airport, Tuolumne County, consisted of two aircraft; a surplus Navy Grumman TBM torpedo bomber which carried 600 gallons of borate, and a Stearman having a capacity of 100-120 gallons. During the contract period from July 25 to October 15

initial attack was made on 19 fires with 113 drops.

The Southern California project located at Ramona airport, San Diego County, had two surplus TBM torpedo bombers each with a capacity of 600 gallons. From August 18 to December 30 initial attack was made on 45 fires with 182 drops.

An operation of short duration, from September 5 to October 15 was established at Sequoia Field, Tulare County with one TBM. Four fires were attacked with a total of 14 drops.

At Salinas airport, Monterey County, a limited project was active from September 11 to October 8 with two Stearman tankers and a Cessna 180 combination tanker and observation airplane (described elsewhere in this report). During the operating period attack was made on 6 fires with 28 drops.

As many fires as possible were photographed both during and after control; reports prepared by air and ground forces on factual data concerning the action taken and subjective appraisals of the degree of success were obtained from those in position to form an opinion.

Fire records are being closely examined both within the operating area of the air attack squadrons as well as in adjacent areas. The frequency of fires being attacked in the various size classes compared to the frequency of final control sizes provides an objective measure of the degree of success encountered through use of air tankers this past year when that record is viewed alongside the past five year record of the same areas.

While the objective evaluation has not yet been completed, it would appear from the subjective analysis that initial attack by air tankers made important savings on 11% of the 127 fires which qualified under our definitions of "initial attack" and which were analyzed for this purpose. While not stopping the fires by air action alone, it was felt that air action materially aided ground forces in controlling another 11% of the

127 initial attack fires. They were credited with providing partial aid in 45% of the 127 fires. While not qualifying as initial attack, the air squadrons hit 69 additional fires.

Pilot skill and experience was a greater contributing factor to success than was plane type, other factors such as burning conditions being equal.

D. Fire Economics:

The California Division of Forestry has given full recognition to the importance of establishing the kind and magnitude of values being protected by our fire control system. There are the coexisting problems of determining what effect different alternative levels of protection will have on reducing losses to the above values, and also how the costs of the various alternatives compare to such loss reductions.

We have contracted with the University of California, School of Forestry, for the purpose of conducting research on these economic considerations. The objective of this research will be to develop the methodology whereby we can analyze all fire damages in comparison to fire suppression costs so that the benefits to be obtained from a fire protection organization can be maximized at a minimum cost. Values are currently being analyzed on a pilot-area basis. Sonoma County has been selected as an area possessing great diversity of land use and therefore representative of a rather complex economic structure.

E. Fire Weather:

(1) Cloud Nucleation For Lightning Prevention

The California Division of Forestry again had an active weather modification project under study in the northeastern portion of the State. Although the design and area were modified somewhat from the 1957 project, the objective remained essentially the same: We wished to test the practicability of modifying cumulus cloud build-

ups so as to prevent or reduce the frequency of cloud-to-ground lightning and, consequently, to reduce the number of forest fires caused by lightning; furthermore, we wished to determine if this goal could be obtained through the use of ground generators located at California Division of Forestry and U. S. Forest Service facilities and operated by regular station personnel. A secondary goal was established - that of accomplishing the above feat without adversely affecting the normal precipitation pattern in the general target area.

Although it appeared the 1957 operation produced a 50% reduction of lightning fires, the multiple regression analysis performed by the California Forest and Range Experiment Station under the terms of the contract with the Division indicated that this reduction was not statistically significant. It was therefore decided to modify the 1958 project as follows:

1. The 50 ground based generators would be improved and would be located in an area only one-half as large as the 1957 target area. Forty generators were set up at individual sites and ten were doubled up at five other sites on the 3000 square mile area.
2. Rather than compare lightning occurrence on a treated area to occurrence on an untreated adjacent area throughout the summer, treatment of the target area would be accomplished by a randomization method. Thus approximately 50% of the days forecast as having a thunderstorm potential would be seeded. This system must, of course, assume that both seeded and unseeded days would have the same lightning (and lightning fire) potential.
3. The California Department of Water Resources cooperated in the project and assisted in the establishment of ten recording

rain gauges throughout the area to augment the ten other gauges already in or near the area.

4. The Department of Water Resources also contracted with a private meteorological concern, Meteorological Research, Incorporated, of Pasadena, to furnish a mobile radar station for adding data to the precipitation study. Time lapse photography of a slave scope recorded the development of moisture cells and provided a record of their movement through and beyond the target area.

5. Pilot balloon studies were made of several potential generator sites throughout the area to determine the convection, or lift, characteristics encountered above those sites on typical thunderstorm days.

6. Flights were made over the target area with a "cold box" and nuclei counts were made in an effort to determine concentration and direction of movement of the silver iodide plumes being raised aloft from the ground generators.

7. Also as part of their contract, the California Forest and Range Experiment Station provided a full time meteorologist to assist in the field operation. He helped to coordinate weather information being transmitted to the Reno and Redding weather forecasters from three major lookouts in the area, and also recorded local weather as observed in the target area. He helped service the generators and inspected them for efficiency of operation. The analysis itself was speeded since this individual could commence lightning fire tabulation at the field level. He then assisted the Station's supervising meteorologist in completing the analysis.

Results: Both the zero lift pilot balloon studies and the nuclei counts indicated that the thermals created by local heating and which produce the normal convection type thunderstorm disappear as the

cumulus clouds mature. As the sky cover increases, it becomes very difficult to locate ascending air. Thus continuing treatment of a cloud area by ground generators becomes progressively more difficult. If the thunderstorm build-ups are occurring because of orographic uplift (moist air flow being forced up mechanically as the flow encounters topographic obstacles) this problem may not be so serious.

When nuclei were apparently being introduced into the clouds, radar records indicated that the clouds showed ice in the sheared off tops at an elevation of 20,000 to 23,000 feet. Clouds beyond the effect of seeding did not glaciate until they had reached 27,000 feet msl. Lightning to ground was observed from those clouds with tops 27,000 feet and above. There may have been strikes from lower clouds but which were unobserved. Lightning to ground was observed from some clouds which gave unmistakeable evidence of having been seeded.

The analysis by the Station of recorded lightning fires bears out the results of somewhat similar studies - elsewhere lightning may have been intensified by the seeding treatment. The apparent increase in the number of fires reported on 13 seeded days as opposed to those reported on the 13 unseeded days had one chance in four of being accidental. Sixty-three percent of the lightning fires recorded occurred on only two of the seeded days. The synoptic weather condition prevalent on these two days is under further study.

Associated with an apparent increase in lightning activity was an increase in precipitation. It may be that a general reduction in fire danger due to this added moisture could have more than offset the hazard of a greater lightning fire incidence. This suggestion must be further explored.

(2) Fuel Break

The Division of Forestry is an active cooperator with the U. S.

Forest Service and Los Angeles County in this fire research project. This cooperation is both through the contribution of funds to the Station and by utilization of field personnel and inmate crews on field projects which tie into the needs of the program.

Many, many miles of roadsides and ridge tops have been mechanically and hand cleared in widths up to 300 feet during the past few years by the Division of Forestry. Those breaks thus established in Southern California readily qualify as pilot-plant projects on which to study maintenance and conversion techniques - one of the top priority problems faced by Fuel Break.

(3) Fire Danger Rating

The year 1958 saw the start of the cooperative Fire Danger Rating system in California through the operation of the Burning Index, a product of a joint project of the California Forest and Range Experiment Station, the U. S. Weather Bureau, the U. S. Forest Service and the California Division of Forestry. During the spring of 1958 a representative of the Division and one from the U. S. Weather Bureau personally contacted almost every Ranger Unit in the state. The exception was the North Coast District where extensive experience in 1957 had already familiarized the personnel with the Burning Index. In each case the system was explained and questions answered. Since the system operates within local climate areas called Fire Danger Rating Areas, these climate zones were pointed out and discussed with the Ranger Unit personnel. Suggestions were made by them concerning inclusion or exclusion of weather stations, establishment or deletion of weather stations, possible subdivision of the climate zones because of size or administrative problems and the recommended fuel type to be rated. In conjunction with these contacts inspection of

field weather stations was also carried out with about 50 stations inspected. The inspection program was continued during the year with an additional 15 stations visited.

Soon after the completion of the field explanation, a representative of the Division and of the Experiment Station met to adjust conflicts within Fire Danger Rating Areas, both between federal and state agencies and from within each agency. A master list of Rating Areas with their included areas was prepared and sent to the field. Forms and manuals were distributed to the field in time for the various units to train their observers and operation was begun statewide on June 1.

In addition, several forms and reports were prepared to assist the field in preparing the Average Burning Index for a Rating Area and for the prediction of the Index for the next day.

During the 1958 season, a total of 130 weather stations were utilized in the portion of the program assigned to the Division of Forestry. The Federal agencies had about the same number of stations. Of these 130 stations, 15 were operated by three contract counties, Los Angeles, Ventura and Kern, 1 by the U. S. Army at Hunter Liggett Military Reservation in Monterey County and 1 by the U. S. Weather Bureau at Red Bluff in Tehama County. From these stations about 24,000 days of weather observations were recorded and about 46,000 Burning Indexes computed. During the fall of 1958, preliminary planning was undertaken with the California Forest and Range Experiment Station for the entry of this data on punch cards.

Other programs associated with the Burning Index have been carried on, in particular the construction of additional anemometer reset counters. These instruments count the anemometer contacts over periods of several hours, thus producing a more accurate picture of

the wind conditions prevailing in the afternoon.

Work continued on preparation of training and refinements in the system for the 1959 season. It is of importance to note that the system is being operated jointly by all Fire Control agencies in the wildland areas of the State of California. The system has already shown its potential through the establishment of a common descriptive language capable of interpretation anywhere within the state.

(4) Fire Climate

The contract with the California Forest and Range Experiment Station for a study of local fire climate was continued. The Division participated in the instrumentation of one particular troublesome canyon in San Diego County near De Luz. Unpredicted weather conditions have caused considerable difficulty to suppression forces in the past when fighting fire in this canyon. Mid-afternoon down canyon winds developed on three days of the three week period of instrumentation. These winds occurred without the presence of a noticeable on-shore gradient wind and was contrary to what normally might be expected during the hottest part of the day. Analysis of synoptic weather conditions is now underway in an effort to find an explanation for this behavior.

3. IMPORTANT CHANGES IN PROTECTION PLANS, ADDITION OF PERMANENT PERSONNEL, ETC.:

A. 1956 Fire Plan Revision:

No further implementation of the Fire Plan was received during 1958.

B. Training:

The full-time training centers at Ramona in San Diego County and Sutter Hill in Amador County conducted five-week training sessions for new drivers during the spring and winter periods.

Ranger Unit personnel augmented the assigned training staff of one

Ranger and one Associate Ranger. The centers were closed during the more active portions of the fire season and the training center personnel examined operating conditions in the field, in order to adjust the training program to meet deficiencies noted in operating procedures in the field. The training program was developed for the Forest Firefighter Foreman class with the first classes to be scheduled in February of 1959.

The Training Committee completed the divisional training policy and developed a system for reporting training that was applicable to a punch card system.

The Division's Flying Squad Training Program was again offered to the field with all of the districts participating in several courses. The Flying Squad Programs are now being offered down to the Assistant Ranger level in order to acquaint all administrative personnel with management techniques.

All districts reported a greatly increased training program at the District and Ranger Unit level. Courses are becoming somewhat more formalized and resemble the Flying Squads from the Sacramento office.

Increased emphasis was placed on the training in fire fighting skills at the Ranger Unit level in line with the Division's policy of increased emphasis on heavy initial attack.

The merit award system is undergoing study at the present time in order to speed up the analysis of the suggestions and put the meritorious suggestions into action in a more rapid manner.

C. Conservation Camps:

One 80-man conservation camp was completed in 1958 in Calaveras County. This is the Vallecito Conservation Camp. The conservation camps operated in cooperation with the Department of Corrections total 13 in 1958. The Beaver Creek Camp was increased by 10 inmates to a capacity of 60. In 1958 we operated 13 conservation camps with the total population of 795 inmates.

Three new 80-man camps were contracted for by the Division of Architecture and construction was started in 1958. These are the Crystal Creek Camp in Shasta County, Chamberlain Creek Camp in Mendocino County, and Puerta La Cruz in San Diego County.

The Forestry Camps operated in cooperation with the Department of Youth Authority maintained their 1957 status. In other words, there are three main camps and three spike camps, for a total population of 265 wards. One additional 80-ward CYA camp was budgeted for site preparation in 1958 and a site is being provided under special use by the U. S. Forest Service in Nevada County.

D. Personnel Changes: 1958-59

Sacramento Administration:

One State Forest Ranger I has been provided under the Business Management section to assist the field forces in establishment of proper procedures for warehouse management, the development of fiscal manuals applicable to Forestry activities, and general assistance in handling an overall increasing workload.

0.3 Engineering Student Trainee budgeted to assist the Engineering Staff during the summer months. This position will perform routine drawings and other duties that will be assigned by the Engineering Staff.

Forest Protection Field Services:

One State Forest Ranger I. During the current year the Nevada County and Yuba Ranger Units were consolidated. This resulted in the deletion of this position.

Forestry Conservation Camps:

The budget provides for transfer from Capital Outlay to support funds for 2 Forestry Work Project Supervisors for the Chamberlain Creek and Plum Creek projects. A Forestry Wrok Project Supervisor has also been added for the operation of the Beaver Creek-Folsom project. 20.3 man years of

Forestry Work Project Foremen, and 2.1 man years of Forestry Equipment Operator have been provided for the new camps to be activated during the 58-59 fiscal year. Positions are budgeted on a workload base contingent on the inmate complement of the facilities.

State Nursery:

One Forest Technician. This position to be assigned to the Davis Nursery for supervision of the nursery program at that facility. This function was formerly provided by a Senior Forest Technician position. Because of program responsibilities assigned by Chapter 2313, Statutes of 1957, it is necessary to provide for increased workload. The new Legislation cited provides studies and experiments in vegetation. The Senior Forest Technician position previously referred to has been assigned the survey program as well as continuing responsibility for the nursery program.

The Division's forest fire suppression strength was increased as follows:

	Yearlong Employees	
Class	1957-58	1958-59
Crew Foreman	360	362
Patrol Foreman	36	36
Forest Fire Truck Driver	246 (79 County Contract during Winter)	247 (78 County Contract during Winter)
Forestry Equipment Operator	114	114

For comparative purposes with other states, the Division of Forestry top (after four years of service) pay grades now are:

DIVISION OF FORESTRY PERSONNEL

Authorized Strength

All Functions

No.	Title	Monthly Salary
1	State Forester	$ 1,200
1	Chief Deputy State Forester	1,100
11	Deputy State Forester	950
11	Assistant Deputy State Forester	782
1	Training Officer Grade I	745
17	State Forest Ranger Grade II	710
32	State Forest Ranger Grade I	644
48	Associate State Forest Ranger	613
141	Assistant State Forest Ranger	584
12	Forestry Trainee (3-Step Range)	481
7	Senior Forest Technician	710
26	Forest Technician	644
18	Assistant Forest Technician	584
19	Forest Fire Dispatcher	505
1	Law Enforcement Coordinator	782
2	Supervisor of Conservation Education	710
6	Forest Fire Prevention Officer	644
3	Forestry Equipment Engineer	710
20	Forestry Work Project Supervisor	613
120	Forestry Work Project Foreman	556
398	Forest Firefighter Foreman (398 Yearlong)	505
247	Forest Firetruck Driver (3-Step Range) (247 Yearlong)	436
114	Forestry Equipment Operator (114 Yearlong)	505
1178	Forest Firefighter (Seasonal Only)	341
119	Forest Fire Lookout (Seasonal Only)	358
206	Camp Crew Cook (28 Yearlong)	376

4. FIRE EQUIPMENT AND IMPROVEMENTS

A. Equipment

1. Inventory:

During 1958 (**) the Division had in operation the following equipment:

Transportation		Firefighting Equipment		Construction and Maintenance Equipment	
Sedans	104	Pumpers:		Maintainers	23
Station Wagons	29	Firetrucks FWD	138	Dump Trucks	29
Panels	15	Firetrucks Conv	235	Cement Mixers	34
Pickups	211	Pickup Pumpers	38	Compressor Trucks	3
Stakesides	169	Bulldozers:		Compressor Trailers	22
Jeeps	61	Large	48	Front End Loaders	9
		Medium	24	Miscellaneous	24
		Transports:			
		Large	30		
		Medium	25		
		Misc. Equipment:			
		Wheel Tractors	6		
		Discs	14		
		Small Tractors w/plow	2		
		House Trailers	13		
		Various	8		
		Special Service	33		
		Miscellaneous	26		

** Up to July 1, 1959 - end of present fiscal year.

During 1958, (58-59 F. Y.) the following vehicles were received and placed in service:

7	Sedans
7	Station Wagons
18	Pickups
26	Stakesides
8	Firetrucks FWD
4	Firetrucks Conv
3	Tractors
7	Transports
5	Mobile Service Units
2	Motor Graders
3	Dump Trucks
2	Concrete Mixers
3	Air Compressors
1	Pickup Pumper
1	Loader
1	Disc
2	Semi Trailers
1	Panel
4	House Trailers

2. Equipment Development:

The new technique for handling, storing and using single jacketed fire hose in a "doughnut" roll, mentioned in the 1957 report, was tested further during the year and has been accepted for use throughout the Division. A hose roller designed for this particular method of handling hose was developed by Division personnel and is in commercial production. The new system requires certain modifications to equipment and a number of rollers in each administrative unit to be completely successful. As rapidly as we can acquire rollers and modify existing equipment the process will be adopted.

Several years ago, one of our field personnel developed a pocket sized hose clamp for 1" and 1½" single jacket fire hose which aided greatly in the application of extended and progressive hose lays. Through the cooperation of a manufacturer of fire equipment, the clamp has been improved and is now commercially available.

For years field personnel have stressed the need for a crawler type off-highway fire tanker or personnel carrier. Since several manufacturers are interested in this field with at least one having a machine in production ("Pack-Rat") the Division acquired six weasels from surplus for the purpose of making modifications to them to meet the desired needs, and to test them under field conditions. Much valuable information can be obtained from this program which will be of value to forest agencies and manufactures at a minimum of expense.

The seventh in a series of Pilot Model Fire Truck development was completed and placed in the field during the fire season. The truck featured an automatic transmission and a radical change in the accepted color of fire apparatus: (high visibility yellow to aid in spotting equipment either from the ground or from aircraft). After one season of use, a number of changes were suggested to improve its efficiency.

It appears the performance of the unit with the automatic transmission is better than previous conventional geared equipment. The color proved to be more distinguishable, but there are some reservations yet as to acceptance.

With the increased use of aerial detection during low visibility conditions, the Division designed and constructed a 60 gallon borate tank with drop gate for a 180 Cessna normally used for detection and reconnaissance. Brief tests indicated this size and type airplane could prove to be a valuable combination tool. The tank is placed in the cabin of the plane in lieu of the rear seat with the outlet extending through a 15" diameter round hole in the fuselage (camera part either available as a field modification kit, or from the factory). The ship can be certificated for dual use, and the gross weight with a pilot and observer and full tank is under "standard category" maximum gross weight limits.

B. Improvements

1. Structures:

In 1958, 30 construction projects were completed and 9 grounds and water projects.

a. One complete district headquarters at Fresno was built, consisting of a two-story 36' x 153' office building; 50' x 220' warehouse with 22 stall vehicle storage shed attached; gas and oil house; combination 4 stall auto shop and 2 stall radio shop; paint storage building; and relocated 14 stall equipment shelter.

b. One complete conservation camp at Vallecito including 80-man barracks building, recreation building, 2 combination barracks (25' x 92') and office buildings, gas and oil building, 100-man messhall building, 12 stall equipment building, 40' x 180' combination warehouse and shop, 2 three bedroom residences, and 4 stall residence garage.

c. Three combination barracks, messhall and 3-bay equipment buildings as follows:

10 man combination building at Flinn Springs, San Diego county.
11 man combination building at Corona, Riverside county.
14 man combination building at Julian, San Diego county.

d. One combination 13 man barracks and messhall at Del Puerto, Stanislaus County.

e. 10 man expansion of barracks at Beaver Creek, Tuolumne County.

f. Two 3-bedroom residences and separate garages, one at Squaw Valley in Fresno County and at Point Arena in Mendocino County.

g. One 19' x 56' combination office and classroom at Sutter Hill Training Center, Amador County.

h. One 30' lookout tower with living quarters at Grasshopper, Humboldt County.

i. One lookout cab modification including catwalk and sliding glass windows at Mt. Howell in Placer County.

j. One 3 stall vehicle and equipment shop at Redding, District II Headquarters.

k. Four 2 stall equipment buildings located at Lassen Lodge, Tehama County; Elk Creek, Glenn County; Ogo, Shasta County; and French Gulch, Shasta County.

l. One 3 stall equipment building at Weaverville, Trinity County.

m. Three single stall equipment shelters with storage room at Wilbur Springs, Colusa County; Cazadero, Sonoma County; and Gordon Valley, Napa County.

n. One single stall, pole type equipment shelter with storage room at Brooks, Yolo County.

o. Two 2 stall equipment shelters with storage room at Rockport, Mendocino County, and Fernwood in Humboldt County.

p. Six 6' x 10' gas and oil shelters located at Weott, Humboldt County; Leesville, Colusa County; Bridgeville, Humboldt County; Wilbur Springs, Colusa County; Las Posadas, Napa County; and Brooks, Yolo County.

2. Grounds Developments:

a. Spanish Flat, Napa County
b. Rincon, San Diego County
c. Pilot Rock Conservation Camp, San Bernardino County
d. Buckhorn, Shasta County
e. Chamberlain Creek Conservation Camp, Mendocino County
f. Willits, Ranger office site, Mendocino County

3. Wells:

a. Rincon, San Diego County
b. Spanish Flat, Napa County
c. Dobbins, Yuba County) Dug drift at bottom of dug
d. Iron Mine residence, Placer County) wells to improve water
) supply

4. Bridges:

Two bridges were constructed in Mendocino County in the Jackson State Forest increasing our Class C Bridges (timber span) by 31 feet. Our bridge inventory, however, was reduced by 4 bridges in District I, so we have a net decrease of bridge footage by 40 lineal feet in District I. In District II seven bridges were abandoned and the following decreases occurred in our bridge inventory:

Class B (steel beam) 19 lineal feet
Class C (timber span) 18 lineal feet
Class E (log span) 157 lineal feet

5. Maintenance and Improvements:

Many projects of maintenance and minor improvements were accomplished in 1958 and suppression crew personnel including foreman were actively engaged in maintenance and minor improvements. Wherever possible inmate and ward labor was used on maintenance projects. This work included everything from minor repairs of structures to reconstruction of roads and hazard reduction.

6. Roads, Telephone and Power Lines:

In road construction considerable mileage of road was reconstructed and improved and new construction appeared on the Jackson State Forest with 2 miles of road being completed on the James Creek access and 4.5 miles on Chamberlain Creek. The mileage of roads maintained throughout the State is as follows:

District I	368.0
District II	1046.7
District III	618.0
District IV	481.2
District V	357.5
District VI	556.0
	3427.4 miles (Statewide)

Telephone Lines:

The main telephone line change made in 1958 constituted 24 miles of grounded telephone line construction in Butte County, from

Stirling City to the Transfer Station to Chico Meadows and Colby Mountain. Telephone line mileage by Districts is as follows:

	Grounded	Metallic
District I	155.0	109.0
District II	249.7	390.1
District III	124.0	471.3
District IV	16.0	238.0
District V	82.0	174.5
District VI	.0	198.2
Statewide Total	626.7	1581.1

Power Lines:

There was no change in power line mileage. It remains at 13 miles for statewide total.

7. Land Transactions:

The Division acquired fee simple title to two parcels of land in 1958. These were for the Ahwahnee and Boonville stations. New leases and renewal of leases and lease terminations were accomplished on about 30 parcels. Five transactions involved transfer of use and control between other State agencies and the Division in which the Division of Forestry acquired 14 acres for the Folsom Lake Conservation Camp site. On four sites some Forestry acreage was transferred to the use of Division of Highways for their right of way. A conservation camp site was located near Bieber in Lassen County and negotiations for purchase were started. A residence site for the Pilot Rock Conservation Camp was procured from the San Bernardino National Forest and request for Special Use Permit established. Negotiations were started with the Tahoe National Forest for the Washington Ridge Forestry Camp site. Construction is contemplated on this site for 1959.

8. Maps:

The Lassen County administrative map was completed and transmitted to the field. A portion of Plumas County is included on this

map. A complete set of maps delineating areas for State fire protection have been completed and are on file in the State Forester's office. Numerous charts and right of way maps were completed during the year as well as drawings and training aids for meetings and conferences.

C. Radio

Additional radio channels have been allocated to the Division of Forestry. Administrative districts will be placed on frequencies to permit intradistrict operations without interdistrict interference. A common frequency for a statewide fire net is being planned to allow flexibility of operation of automotive equipment between districts. A statewide net for aircraft is being placed in operation so the planes can operate independently of and not in competition with the ground forces.

Long range planning includes studies into the feasibility of interconnecting the Ranger Unit Headquarters, the District Offices, and the Sacramento office using a microwave linkage.

1958 Inventory of Radio Equipment on hand and on order

Dist	Mobile	Handie Talkies	Air Craft Radios	Portables	Land Stations	Land Sta Rec'rs	F.F.S. Transceivers	L.O. & F.F.S. Sta. Rec'rs	Portable Rep'trs
I	204	91	16	8	12	1	20	14	4
II	183	76	-	7	8	-	15	22	1
III	167	80	14	6	10	1	16	13	1
IV	122	69	3	2	7	-	4	6	1
V	142	78	2	6	7	10	12	8	1
VI	206	84	7	6	10	-	24	3	2
Totals	1024	478	42	35	54	12	91	66	10
					Grand Total				1812

5. FIRE PREVENTION

Forest fire prevention programs in California are the result of activities of many public and private agencies, organizations, and individuals. Through coordination, a wide variety of programs are developed and conducted which are designed to acquaint the individual citizen with the need for preventing fires in the forest and wildland areas.

For the second consecutive year there was a significant increase in the number of man-caused forest fires in the watershed areas. It is expected that the addition of Patrolmen and Assistant Fire Prevention officers will assist in the field programs designed to offset the increasing risks resulting from expanding use and occupancy of the wildland areas.

Although no specific reasons are evident to account for this increase, several interesting aspects stand out in reviewing the statistics shown later in this report.

Fires attributed to railroad are down, due in part, to the use on some lines of a new-type spark arrestor on trains operating in hazardous areas. The fact that the number of forest fires started by "local" people increased over last year and the previous five-year average, would tend to indicate that greater emphasis must be placed on the prevention program at the local level.

This report, while dealing principally with activities of the California Division of Forestry, recognizes and includes contributions of others on a co-operative basis. For ease of reporting and clarity, the report is divided in two sections; the first dealing with activities of the District and Ranger Unit field personnel; the second covering the mass media educational program.

1. Field Personnel Activities:

The local "Keep Green" and other fire prevention organizations, private industry, and the various protection agencies worked harmoniously both together and independently in the same areas on fire prevention programs.

The statistics which follow are offered to indicate the concerted effort directed toward the prevention of forest fires and to show the scope of these activities in relation to the other phases in a broad fire prevention program.

A. Newspaper Publicity - 1958

1. Made 6,965 contacts with the press which resulted in editorials, fire news, and other prevention copy.

2. Made 1,765 news releases.

3. Made 88 contacts with press which resulted in 62 drop ins and 26 sponsored advertisements.

B. Radio Publicity.

1. Participated in 740 radio presentations (talks, interviews, and programs).

2. Presented material for 921 short announcements.

C. Visual Education.

1. Distributed 2,275,000 pieces of printed material including posters, leaflets, pamphlets, stickers, etc.

2. Arranged for 408 displays in store windows, theaters, and public buildings.

3. Made 1,804 postings on Division of Forestry 4' x 8' highway right-of-way road signs.

4. Displayed 178 floats and/or equipment which were viewed by 275,000 people.

5. Made 73 exhibits at fairs which were viewed by 2,000,000.

D. Group Contacts.

1. Presented 1,211 programs with and without films which were attended by 52,400 adults.

2. Presented 2,658 programs with and without films attended by 130,000 children.

E. Training.

1. Held 2,745 training programs with an attendance of 20,851.

F. Personal Contacts.

1. Made 392,000 personal contacts at fair booths and equipment exhibits.

2. Made 183,000 contacts during normal work day.

3. Made 94,800 personal contacts during 52,000 man hours spent on patrol duty.

G. Permits.

1. Issued 151,837 regular burning permits.

2. Issued 543 range improvement permits.

H. Inspections (Zones 1 and 2).

1. Sawmills - 913.

2. Other Mills - 121.

3. Logging Operation areas - 2,398.

4. Industrial areas (other) - 226.

5. Dumps (public and private) - 1,042.

6. Public areas (recreational, school, etc.) - 471.

7. Residential areas (farm and mountain) - 11,015.

8. Mechanical equipment (farm, logging, construction, etc.) - 4,417.

I. Hazard Reduction (Zones 1 and 2).

Rights-of-Way

1. State and county highways (disced, burned, or treated) - 361 miles.

2. State and county highways (disced, burned, or treated in cooperation with others) - 388.

3. State and county highways (disced, burned, or treated by others) 1,303.

4. Railroads fireproofed (cooperative) - 296 miles.

The following statistical record lists, by per cent of total of man-caused fires, locations, causal agents, and causes of forest fires occurring in the Division of Forestry's direct protection responsibility area (Zones 1 and 2):

Location	%
Roadside	29.10
Logging and Lumbering Areas	2.80
Wildlands	40.80
Dooryards	16.60
Cultivated Areas	3.10
Railroads	3.10
Dumps	2.60
Miscellaneous	1.90
	100.00

Causal Agents	
Rancher-Farmer	12.40
Tenant	12.10
Children	14.00
Traveler	21.90
Commercial Transporter	.40
Forest Product Worker	3.20
Construction Worker	2.00
Hunter	8.90
Fisherman	1.10
Recreationist	3.70
Tramp	.90
Railroad & Other Vehicles	5.50
Miscellaneous	13.50
Structural Agents	.40
	100.00

Causes	
Smoker-Matches-Tobacco	40.20
Debris Burning (non-permit)	4.70
Debris Burning - Permit Escape (Land clearing, incinerators, range improvement, trash burning)	15.90
Vehicle	7.40
Railroad - Mechanical	2.10
Incendiary	9.60
Logging-Slash	.10
Sawmill Burner	.50
Power Line	2.20
Campfires	3.00
Blasting, spontaneous combustion, stationary engine, welding, structural	3.00
Miscellaneous	11.30
	100.00

2. Statewide Cooperative Mass Media Education Programs:

The Division of Forestry and Region 5, U.S. Forest Service, again coordinated the activities of the California Fire Prevention Committee.

Annual meetings were held in April and May to develop programs for participation by the membership. Meetings were held in San Francisco for the North, Los Angeles for the South. Out of these meetings came resolutions urging consideration be given by automobile manufacturers to make the ash tray more functional and handier to the driver and passengers and that cigarette manufacturers include forest fire prevention in their advertising. Top management from both of these industries warmly accepted these resolutions and promised full cooperation.

Fire prevention materials for private cooperators and federal, state, and county field personnel produced by the Division of Forestry included seven million pieces of printed materials; i.e., posters, leaflets, stickers, etc., TV spots and motion picture trailers, a 12 3/4-minute educational film, "Caught In The Act", and radio program tape recordings in both English and Spanish.

An additional one million pieces of CFFP, Smokey Bear, materials were distributed. Several organizations produced, distributed, and used large quantities of printed materials in addition to those supplied by the agencies.

Movie trailers were furnished to Fox West Coast Theaters for use in all their houses, and to other smaller chain and independently owned theaters. Prints of TV spots were supplied to all television stations.

Four additional portable exhibits were constructed and used at the State and other regional and district fairs.

6. LAW ENFORCEMENT

Law enforcement activities of the Division resulted in 2,722 cases investigated, which were resolved either through court action or by other action satisfactory to the State. Of this total 245 were criminal cases, 337 were civil cases, with the remaining 2,040 settled administratively. The

following table presents a breakdown of legal action:

Criminal cases initiated	245
Criminal convictions	203
Civil claims initiated	337
Claims collected	43
Pending claims	294

The following table is presented for comparison with the past six years:

Year	Criminal Cases	Civil Cases
1952	147	114
1953	163	91
1954	153	78
1955	109	68
1956	91	130
1957	165	205
1958	245	337

7. INCREASES IN APPROPRIATIONS

1957-58 Expenditures	Estimated 1957-58	Actual 1957-58	Change
Support	$ 14,928,991	$ 14,479,892 -	$ 449,099
Other Current Expenditures	2,867,367	2,747,049 -	120,318
Total	$ 17,796,358	$ 17,226,941 -	$ 569,417
Capital Outlay	$ 4,599,940	$ 2,963,648 -	$1,636,292

1958-59 Budget	Actual 1957-58	Estimated 1958-59	Change
Support	$ 14,479,892	$ 15,489,975 /	$1,010,083
Other Current Expenditures	2,747,049	3,158,086 /	411,037
Total	$ 17,226,941	$ 18,648,061 /	$1,421,120
Capital Outlay	$ 2,963,648	$ 2,799,509 -	$ 164,139

Support:

1957-58

Actual Salaries and Wages were less than the estimated amount by $335,330. Over-expenditures in Administration and Range Improvement functions were offset by savings in all other functions, with an overall savings of 3.23%.

Actual Operating Expenses were less than the estimated amount by $23,375. Field Services is the only function in which actual expenditures exceeded antici-

pated. Otherwise savings were fairly evenly distributed and amount to 1.29%.

Actual Equipment expenditures were less than estimated by $71,589. The greatest savings were in Field Services function, with over-expenditures in Administration, Nursery and Range Improvement. Overall savings amounted to 6.14%.

Reimbursements were $36,583 less than anticipated. The Administrative charge to the United States Forest Service was increased slightly as were other similar charges, and rents from other agencies increased. These were partially offset, however, by a decrease in Clarke-McNary funds, which were $32,642 less than anticipated.

The total savings for 1957-58 in support items was $449,099.

1958-59

Estimated Salaries and Wages exceed the actual amount spent in 1957-58 by $815,296, or an increase of 8.13%. The increase is evenly distributed throughout the functions, with the exception of Range Improvement, which indicates a slight decrease is anticipated.

Estimated Operating Expenses exceed the total amount spent in 1957-58 by $408,996, or an increase of 10.92%, with increases anticipated in all functions except Administration.

Estimated Equipment expenditures are $192,270 less than the previous year's actual expenditures, or a decrease of 17.58%.

Reimbursements are expected to increase by $91,249. A $35,300 increase is anticipated due to increased rates charged the Bureau of Land Management for Forest Fire Protection, and again Subsistence reimbursements are expected to increase.

The total estimated increase for Support in 1958-59 over 1957-58 is $1,010,083.

Other Current Expenses:

1957-58

Actual expenditures were $120,318 less than anticipated for Other Current Expenses. The savings were reflected principally in Emergency Fire Suppression and Detection and Forest Insect Control.

1958-59

Other Current Expenses estimated for 1958-59 are $411,037 higher than actual expenditures for the previous year. The increase is principally in U. S. Forest Service, Emergency Fire Suppression and Detection, and the Forest and Fire Research Program.

Capital Outlay and Savings:

The decrease in actual expenditures under estimated expenditures was again due to delay in beginning construction of Conservation Camps, due to site problems.

8. LEGISLATION

No new legislation was enacted affecting the fire control operations of the Division of Forestry.

9. PROGRESS MADE IN MEETING FIRE PROTECTION STANDARDS AND OBJECTIVES

Although the 3109 forest fires occurring on the 19.8 million acres of Clarke-McNary (Zone 1) lands in California in 1958 was the highest number of such fires in the prior eleven year period (1948-1958), there is some reason to believe that even in the field of fire prevention some progress has been made in meeting reasonable fire protection standards and objectives. This belief is sustained by the knowledge that the overwhelming majority of forest fires on these lands (95%) are set by people, inadvertently or otherwise, and that during the same period (1948-58 inclusive) California population increased by 4.5 million persons, or almost forty five percent of the 1948 base of 9.9 million people. Since this increase in population represents an average yearly increase of about four percent of the base, the 1958 increase in Zone 1 forest fires of forty four percent above the 1948 base of

just four percent per annum during the intervening period, suggests that if no great progress in the field of fire prevention were made in 1958, at least no ground was lost in this area.

Concerning progress made in the field of fire suppression on Clarke-McNary lands in California during 1958, it is notable that though the 164 thousand acres burned in this area in the face of an increased fire incidence load was third highest in the prior ten year period, excluding 1958, the average number of acres per fire in 1958 was just ten acres less than the ten year average of 63 acres per fire.

California Clarke-McNary Lands

Total Fires	Acres Burned	Acres per Fire	Annual Average % of C.M. Lands Burned
	1948-52 Average		
2456	145,000	68	.74
	1953-57 Average		
2088	133,000	59	.68
	1957		
2038	110,000	41	.56
	1958		
3109	164,000	53	.83

10. COOPERATIVE AGREEMENTS FOR PROTECTION OF STATE AND PRIVATE LANDS

1. Clarke-McNary Land Protection:

The State Forester contracts, by cooperative agreements, for the protection of Clarke-McNary lands with the U.S. Forest Service and the six contract counties of Kern, Los Angeles, Marin, San Mateo, Santa Barbara, and Ventura, as follows:

C-M Lands Protected by the State	12,945,787
C-M Lands Protected by the U.S. Forest Service	5,245,649
C-M Lands Protected by the Contract Counties	1,618,555
Total	19,809,991

2. Federal Lands Protected by the State:

Agency	Area-Acres	Method of Payment to State
Bureau of Land Management Unappropriated Public Domain:		
Zone I	1,184,778	16¢/Acre/Year
Zone 2	509,597	11.71¢/Acre/Year
Other	330,000	None
Grazing Lands Zones 1, 2 and 3	690,000	Fire Cost Reimbursement
U. S. Forest Service	389,783	
Bureau of Indian Affairs	267,195	Fire Cost Reimbursement
Other Government	225,000	None
Total	3,596,353	

3. Total Land Area Directly Protected by State:

* Zone 1 and 2 30,300,000 Acres

** Zone 3 (23 Counties) 8,885,000 Acres

* All State, private and intermingled federal lands, which are directly protected by the State and are primary watershed or timber lands with contiguous secondary watershed and grazing lands. (12,945,787 acres are Clarke-McNary)

** Rural, agricultural, grazing and wildlands not qualifying as State responsibility, but which are protected by the State on an actual presuppression cost basis reimbursed by the county concerned. Each county buys protection desired.

11. NUMBER OF FOREST FIRE FATALITIES

The pilot of an airtanker under contract to the Division of Forestry was killed on a fire in the Lake Ranger Unit on September 15, 1958.

12. NATURE AND EXTENT OF MILITARY COOPERATION

The Division of Forestry received the following assistance from the Military forces during 1958.

1. In Zone I, on 9 fires, 7,540 man hours were expended.

2. In Zone II, on 4 fires, 32 man hours were expended.

3. In Zone III, on 32 fires, 466 man hours were expended.